In this issue:

- IV remifentanil PCA vs IM pethidine for labour pain
- Amisulpride prevents PONV in high-risk patients
- Peripheral nerve block in diabetic neuropathy
- Preoperative carbohydrate loading in paediatric anaesthesia
- Inhalation vs IV induction anaesthesia
- Subarachnoid adrenaline for repeat caesarean delivery
- Continuous non-invasive BP monitoring during non-cardiac surgery
- Propofol and neurocognitive recovery in the elderly
- Femoral nerve catheter vs local infiltration for analgesia in TKA

Abbreviations used in this issue:

ASA = American Society of Anaesthesiologists Physical Status Classification System; BP = blood pressure; FEV1 = forced expiratory volume in 1 second; FNb = femoral nerve block; IM = intramuscular; ISSB = interscalene block; IV = intravenous; LMA = laryngeal mask airway; MAP = mean arterial pressure; MMSE = Mini-Mental State Examination; OR = odds ratio; PACU = post-anesthesia care unit; PCA = patient-controlled analgesia; PCOD = postoperative cognitive dysfunction; PONV = post-operative nausea and vomiting; RCT = randomised controlled trial; RR = risk ratio; TKA = total knee arthroplasty.

Intravenous remifentanil patient-controlled analgesia versus intramuscular pethidine for pain relief in labour (RESPITE): an open-label, multicentre, randomised controlled trial

Authors: Wilson MJA et al.

Summary: The RESPITE open-label, multicentre RCT, was undertaken in 14 UK maternity units and involved women aged ≥16 years who were beyond 37 weeks’ gestation, in labour with a singleton cephalic presentation, and who requested opioid pain relief. Study participants were randomised to receive either the IV remifentanil (40 μg bolus on demand with a 2 min lockout) patient-controlled analgesia (PCA, n = 201) or IM pethidine (100 mg every 4 hours, up to 400 mg in 24 hours, n = 200). The proportions of women who received epidural analgesia after enrolment for pain relief in labour (primary endpoint) were 19% (39 of 201) in the remifentanil PCA group and 41% (81 of 199) in the pethidine group (RR 0.48, 95% CI 0.34-0.66; p < 0.0001). No serious adverse events or drug reactions directly attributable to either analgesic were reported during the study.

Comment: (Charles Herdy) The RESPITE trial sought to improve the evidence base for systemic opioid labour analgesia, with case trialling IM pethidine versus remifentanil PCA. Prior to this trial, there was already a high level of evidence base demonstrating that epidurals were superior to both pethidine and remifentanil PCA for labour analgesia. This was true for outcomes of pain score and patient satisfaction ratings. The evidence base also demonstrated that remifentanil PCAs cause more hypooxic events than either epidural or epidural analogue. Epidural analgesia causes prolonged second stage labour and a higher proportion of instrumental deliveries. RESPITE trial acknowledged the adverse effects of epidural labour analgesia, and sought to clarify the pragmatic analgesic performance of remifentanil PCA versus pethidine. The primary outcome was the proportion of women who required an epidural to be placed for rescue analgesia in labour after randomisation to one of the opioid interventions. The trial recruited exclusively from obstetric units in the United Kingdom, where IM pethidine was already the standard of care for labour analgesia. Women were only eligible for recruitment if they had been informed of the study during antenatal care. The study was non-blinded and progression to the primary endpoint of epidural conversion was made “…according to local practice …individual labour ward protocols.” These factors imply significant opportunity for confounding and bias in the trial design. Indeed, 22 women in the pethidine group but none in the remifentanil group, requested epidural rescue analgesia before receiving the first dose of the intervention. This suggests that a priori patient briefing, an inclusion criterion for recruiting, influenced the primary outcome. The trial found that women were about twice as likely to need epidural rescue analgesia if they had IM pethidine compared to if they had a remifentanil PCA. Remifentanil PCA was found to cause more hypoxia, consistent with previous studies. The clinical implications of the findings are somewhat controversial, given that there has been debate in the literature about the safety of remifentanil PCA after several sentinel events of cardiopulmonary arrest in labouring women. Furthermore, the finding is really only relevant for those women for whom an epidural is contraindicated, including those women who choose to decline epidural analgesia altogether. The mainstream media have also reported this trial. A report from The Times newspaper has been re-published in the Australian lay press (The Australian newspaper, 14 August 2018) with the misleading title, “Pregnancy pain relief drug halves the need for an epidural.” The article states, “Hundreds of thousands of pregnant women should be offered a better pain relief drug that halves the need for epidurals, the first trial of its kind has concluded.” Given the misrepresentation of this study in the lay media, there is some potential for labouring women to explicitly request that anaesthetists prescribe a remifentanil PCA over epidural analgesia. Anaesthetists should be prepared to respond with evidence-based advice, including accurate interpretation of this study.

Reference: Lancet 2018;392(10148):662-72

Abstract
Amisulpride prevents postoperative nausea and vomiting in patients at high risk: A randomized, double-blind, placebo-controlled trial

Authors: Kranke P et al.

Summary: This double-blind, randomised, placebo-controlled, international, multicentre trial involving 1147 adult surgical patients with three or four postoperative nausea and vomiting (PONV) risk factors was used to determine the prophylactic efficacy of the dopamine D2/D3 antagonist amisulpride in combination with other antiemetics. At induction of general anaesthesia, patients were randomised to receive either IV amisulpride (5 mg) or matching placebo, in addition to one standard, non-dopaminergic antiemetic (most commonly ondansetron or dexamethasone). Complete response (no emesis or rescue medication use in the 24-hour postoperative period) occurred in 330 of 572 (57.7%) amisulpride recipients and 268 of 575 (46.6%) placebo recipients (difference 11.1 percentage points; 95% CI 5.3-16.8; p = 0.001). Amisulpride recipients also experienced significantly lower rates of emesis (13.8% vs 20.0%, p = 0.003), any nausea (50.0% vs 58.3%, p = 0.002), significant nausea (37.1% vs 47.7%, p < 0.001), and rescue medication use (40.9% vs 49.4%, p = 0.002). Rates of adverse events and laboratory and electrocardiogram abnormalities were similar between the two groups.

Comment: (Christine Pirrone) PONV is an associated risk of anaesthesia, leading to patient dissatisfaction and increased hospital stay. Patients with three-four risk factors, as per the Apfel criteria, are deemed high risk and it is recommended they receive more than two antiemetics. Amisulpride is a D2/D3 antagonist, and in this study was used in combination with a standard antiemetic (ondansetron or dexamethasone) and elicited increased prophylaxis, decreased nausea intensity and treatment of emesis in patients with high risk for PONV. This was in comparison to standard antiemetic and placebo. Droperidol is a D2 antagonist, that is widely used, however, it does carry a FDA boxed warning of torsadogenic risk, along with a RESEARCH REVIEW publication

Comparison of peripheral nerve blockade characteristics between non-diabetic patients and patients suffering from diabetic neuropathy: a prospective cohort study

Authors: Baeriswyl M et al.

Summary: This Swiss, prospective, cohort study, examined the hypothesis that type-2 diabetic patients with diabetic peripheral neuropathy (DPN) have increased block duration after ultrasound-guided popliteal-sciatic nerve blocks, compared to patients without diabetes or neuropathy. In total, 50 patients received an ultrasound-guided popliteal-sciatic nerve block (1:1 lignocaine 1% and bupivacaine 0.5% 30 mL) prior to surgery. Analysis of the primary outcome (time to first opioid request after block procedure) showed that the DPN group had a longer median time versus controls (1440 vs 710 min; p = 0.0004). Secondary outcomes that did not differ between the groups included minimal stimulating current to obtain a response of the tibial or common peroneal nerves (14 vs 1.0 mA) and rates of procedural complications (n=0 in either group). Time to onset of sensory blockage of the sciatic nerve was shorter in the DPN group by 59%, and motor blockade of the tibial nerve was shorter by 54% and common peroneal nerve by 43%. The cumulative IV morphine equivalent consumption on day 1 postoperatively was less in the DPN group (0 vs 7.5 mg; p = 0.002), and pain scores (numerical scale out of 10) were less at rest (0 vs 3; p = 0.001) and on movement (0 vs 5; p = 0.0003).

Comment: (Sofia Padhy) The authors acknowledged prior studies comparing the efficacy of nerve blocks in diabetic versus non-diabetic patients, but were specifically interested in analysing the results from diabetic patients with formal pre-procedure testing for peripheral neuropathy, to better define the rationale behind decreased dose of regional local anaesthetic administration in patients with DPN. Patients with diabetes, but without peripheral neuropathy were excluded from this study design; however, it may have been beneficial to investigate and include results from this cohort for comparison as well. If no opioid was requested within the first 24 hours, this period was arbitrarily recorded as 1440 min. The total duration of analgesic effect resulting from the dose examined is of value if anaesthetists are considering local anaesthetic dose reduction in patients with DPN. Furthermore, no mention was made as to whether adjuncts, that can prolong duration of nerve blocks (such as dexamethasone), were included/excluded from the protocol. There were several unavoidable differences between the cohorts related to disease process (all patients in the DPN group underwent surgery for diabetic foot gangrene). This impacted (a) patient demographics: 78% of controls were ASA 1-2 versus 12% of the DPN group, and 73% of controls were female versus 12% of the DPN group, (b) surgical factors: average duration of surgery was longer in controls (43 vs 27 min DPN group), and tourniquet usage (65% vs 0% DPN group). The significance of these differences on the measured outcomes is difficult to assess, but must be considered. The authors used an accelerated failure time regression model to interpret the data in an attempt to account for this. Out of 173 patients assessed for eligibility, 117 were excluded for various reasons. Ultimately, the limited sample size restricted the authors from drawing conclusions regarding safety of regional anaesthesia. In fact, there were no differences even though complications were reported in this study. Overall, statistically significant outcomes were demonstrated regarding faster onset, longer duration, and better efficacy of regional nerve block in patients suffering from DPN. However, anaesthetists should still use their own judgement regarding dose of local anaesthetic used in regional nerve blocks for these patients.

Reference: Anaesthesia 2018;73(9):1110-17

Randomised controlled trial comparing preoperative carbohydrate loading with standard fasting in paediatric anaesthesia

Authors: Tudor-Drobjewski BA et al.

Summary: This RCT tested a standard preoperative fast versus a carbohydrate beverage (PreOp™) in children undergoing gastroscopy under general anaesthesia. Carbohydrate loading was associated with less gastric content (p = 0.01), fewer incidents of postoperative nausea (p = 0.028), and no difference in postoperative vomiting. High preoperative visual analogue scores (>5) were recorded in one child in the carbohydrate group versus five in the fasting group. Stool cleansing (n = 61) for simultaneous colonoscopies did not alter any of the intergroup findings.

Comment: (Alice Gynther) Preoperative fasting aims to reduce the risk and severity of gastric aspiration; an uncommon but potentially life-threatening anaesthetic complication. However, fasting also causes postoperative inactivity, protein catabolism and contributes to the surgical inflammatory response. This single centre RCT was conducted on 120 paediatric patients having a gastroscopy under general anaesthetic and examined whether administering carbohydrate beverages two hours pre-induction (CB, n = 60) affected gastric pH and volume (endoscopically aspirated), compared to standard fasting (SF; n = 60). The CB group had significantly reduced gastric content volume compared to the SF group (0.28 vs 0.41 mL/kg; p = 0.01) and reduced postoperative nausea (10% vs 25%; p = 0.028). There was no difference in gastric pH or secondary outcomes of thirst/hunger, discomfort and vomiting. This RCT was well designed with adequate power, used computer-generated randomisation and had similar intergroup baseline characteristics. Although endoscopists and outcome evaluators were blinded, there was no description of data collector blinding with associated possible information bias affecting the subjectively reported secondary outcomes. The effect of some patients having colonoscopies was well considered, with no differences on sub-group analysis. The results of this study support the use of preoperative carbohydrate beverages aiming to ameliorate the catabolic stress response associated with fasting, and to reduce gastric volumes and therefore aspiration risk. This will be particularly significant in malnourished patients, or those having repeated or long procedures. It is important to note that patients with known aspiration risk were excluded from this study, but could potentially be included in future studies, given these results.


Reference: Anaesthesia 2018;128(6):1099-1106

Abstract

Contact Research Review™

Email geoff@researchreview.com.au
Phone 1300 332 322

www.researchreview.com.au
Anaesthesia

MINIMUM PRODUCT INFORMATION: PALEXIA® IR (tapentadol hydrochloride) INDICATION: Moderate to severe pain.

CONTRAINDICATIONS: Known hypersensitivity to tapentadol or any component of PALEXIA® IR, conditions in which mu-opioid receptor antagonist activity is contraindicated e.g. significant respiratory depression and acute or severe bronchial asthma or hypercapnia; confirmed or suspected paralytic ileus; acute intoxication with alcohol, hypnotics, centrally acting analgesics or psychotropic drugs; patients who are receiving MAO inhibitors or who have taken them within the last 14 days. PRECAUTIONS: Monitor for signs of abuse and addiction; repeated administration may lead to tolerance; withdrawal symptoms could occur after abrupt discontinuation; not recommended in patients with increased intracranial pressure, impaired consciousness, or coma and severe renal or severe hepatic impairment; caution in patients with impaired respiratory functions, patients with head injury, brain tumours, a history of seizures or any condition that increases risk of seizures, severe renal impairment, moderate or severe hepatic impairment or biliary tract disease, including acute pancreatitis. Use in pregnancy Category C. Should not be used during breastfeeding. Not recommended for children <18 years old. May impair ability to drive or operate machinery. INTERACTIONS: Care should be taken when combining with mixed opioid agonist/antagonists or partial mu-opioid agonists; additive CNS depression with concomitant administration of other mu-opioid receptor antagonist analgesics, general anaesthetics, phenothiazines, other tranquillizers, sedatives, hypnotics or other CNS depressants (including alcohol and illicit drugs) - reduction of dose of one or both agents should be considered; contraindicated in patients who are receiving MAO inhibitors or who have taken them within the last 14 days; isolated case reports of serotonin syndrome when used in combination with serotonergic drugs (see full PI). ADVERSE EFFECTS: Very common (>1/10): dizziness, somnolence, headache, nausea, vomiting. Common (≥1/100 to <1/10): Decreased appetite, anxiety, confusion, drowsiness, delirium, dysphoria, dry mouth, pruritus, rash, muscle spasms, headaches, pyrexia, feeling of body temperature change. DOSAGE AND ADMINISTRATION: To be taken orally, whole with sufficient liquid, approximately every 4 to 6 hours, with or without food. Usual recommended dose 50 to 100 mg every 4 to 6 hours and should be adjusted to maintain adequate analgesia with acceptable tolerability. Total daily doses >600 mg not recommended. Discontinuation of treatment: taper dose gradually to prevent symptoms of withdrawal. Renal impairment not recommended in severe renal impairment. Hepatic impairment initiate at 50mg every 8 hours (maximum three doses in 24 hours) in moderate hepatic impairment; not recommended in severe hepatic impairment. Elderly patients more likely to have decreased renal and hepatic function – care in dose selection. Not recommended for use in children <18 years old. Based on approved Product Information dated 27 March 2017.


Before prescribing, please review the Product Information available at www.seqirus.com.au/PI

MINIMUM PRODUCT INFORMATION: PALEXIA® IR (tapentadol hydrochloride) INDICATION: Moderate to severe pain. CONTRAINDICATIONS: Known hypersensitivity to tapentadol or any component of PALEXIA® IR, conditions in which mu-opioid receptor antagonist activity is contraindicated e.g. significant respiratory depression and acute or severe bronchial asthma or hypercapnia; confirmed or suspected paralytic ileus; acute intoxication with alcohol, hypnotics, centrally acting analgesics or psychotropic drugs; patients who are receiving MAO inhibitors or who have taken them within the last 14 days. PRECAUTIONS: Monitor for signs of abuse and addiction; repeated administration may lead to tolerance; withdrawal symptoms could occur after abrupt discontinuation; not recommended in patients with increased intracranial pressure, impaired consciousness, or coma and severe renal or severe hepatic impairment; caution in patients with impaired respiratory functions, patients with head injury, brain tumours, a history of seizures or any condition that increases risk of seizures, severe renal impairment, moderate or severe hepatic impairment or biliary tract disease, including acute pancreatitis. Use in pregnancy Category C. Should not be used during breastfeeding. Not recommended for children <18 years old. May impair ability to drive or operate machinery. INTERACTIONS: Care should be taken when combining with mixed opioid agonist/antagonists or partial mu-opioid agonists; additive CNS depression with concomitant administration of other mu-opioid receptor antagonist analgesics, general anaesthetics, phenothiazines, other tranquillizers, sedatives, hypnotics or other CNS depressants (including alcohol and illicit drugs) - reduction of dose of one or both agents should be considered; contraindicated in patients who are receiving MAO inhibitors or who have taken them within the last 14 days; isolated case reports of serotonin syndrome when used in combination with serotonergic drugs (see full PI). ADVERSE EFFECTS: Very common (>1/10): dizziness, somnolence, headache, nausea, vomiting. Common (≥1/100 to <1/10): Decreased appetite, anxiety, confusion, drowsiness, delirium, dysphoria, dry mouth, pruritus, rash, muscle spasms, headaches, pyrexia, feeling of body temperature change. DOSAGE AND ADMINISTRATION: To be taken orally, whole with sufficient liquid, approximately every 4 to 6 hours, with or without food. Usual recommended dose 50 to 100 mg every 4 to 6 hours and should be adjusted to maintain adequate analgesia with acceptable tolerability. Total daily doses >600 mg not recommended. Discontinuation of treatment: taper dose gradually to prevent symptoms of withdrawal. Renal impairment not recommended in severe renal impairment. Hepatic impairment initiate at 50mg every 8 hours (maximum three doses in 24 hours) in moderate hepatic impairment; not recommended in severe hepatic impairment. Elderly patients more likely to have decreased renal and hepatic function – care in dose selection. Not recommended for use in children <18 years old. Based on approved Product Information dated 27 March 2017.

Inhalational versus intravenous induction of anaesthesia in children with a high risk of perioperative respiratory adverse events: A randomized controlled trial

Authors: Ramgolaam A et al.

Summary: The impact of the anaesthesia induction technique on the occurrence of perioperative respiratory adverse events in children at high risk of such events was investigated in this single centre open-label RCT. A total of 300 children aged 0-8 years with ≥2 clinically relevant risk factors for perioperative respiratory adverse events were recruited and randomised to either IV propofol or inhalational sevoflurane. After adjusting for age, sex, American Society of Anesthesiologists physical status and weight, perioperative respiratory adverse events occurred significantly less in children receiving IV propofol induction than those receiving inhalation induction of anaesthesia: 39/140 (29%) versus 64/149 (43%), RR 1.7; 95% CI 1.2-2.3, p = 0.002. The adjusted respiratory adverse event rates at induction were 16/149 (11%) for IV propofol induction recipients versus 47/149 (32%) for inhalation induction recipients (RR 3.06; 95% CI 1.8-5.2, p < 0.001).

Comment: (Matthew Bright) This study investigated the incidence of adverse respiratory outcomes in high-risk children receiving either inhalant or IV anaesthesia. Ramgolaam et al. randomised 300 children aged 0-8 years to receive either inhalational sevoflurane or IV propofol at a tertiary children’s hospital in Western Australia. Children were included if they were reported to have two or more respiratory risk factors and were undergoing a minor elective procedure. Children with at least two respiratory risk factors are more likely to have a perioperative adverse respiratory event with inhalational anaesthesia compared with IV propofol for minor procedures. Classically, inhalational agents were the preferred anaesthesia method in children to avoid pain on injection, bradycardia and dosing difficulties. However, there is a growing interest regarding the use of IV agents in this population, which is further compounded by the increase in allergy, asthma and hyper-reactive airways in children. As the authors have identified, the limitations of the study included relatively small numbers, single centre study, inability to blind assessors and the short duration of the trial. Currently there is limited high-quality research and no evidence-based recommendation for the reduction of adverse respiratory complications in this high-risk paediatric population. Despite these limitations, this study does support the use of IV anaesthesia in high-risk children to reduce post-operative complications.

Reference: Anesthesiology 2018;128(6):1065-74

Abstract

Comparison of anterior suprascapular, supraclavicular, and interscalene nerve block approaches for major outpatient arthroscopic shoulder surgery: A randomized, double-blind, non-inferiority trial

Authors: Auyong DB et al.

Summary: This randomised, double-blind, non-inferiority trial evaluated analgesia with suprascapular block (SCB) and anterior suprascapular block (ASSB), comparing them individually to interscalene block (ISB) in 189 adults, ASA I-III patients undergoing arthroscopic shoulder surgery (rotator cuff or Bankart repair). The primary outcome of the study, mean current pain in the 3-hour postoperative period (0-10 scale), was 2.9 for ISB, 2.5 for SCB (95% CI 1.7-2.9), and 2.0 for ASSB (95% CI 1.4-2.6). On an 11-point scale, the difference in mean PACU pain scores between the SCB group and the ISB group was 0.4 (adjusted 95% CI -0.4 to 1.2; p = 0.088 for non-inferiority) and the difference in mean numerical rating scale pain scores between the ASSB group and the ISB group was 0.1 (adjusted 95% CI -0.7 to 0.9; p = 0.012 for non-inferiority).

Comment: (Peter Malcomson) The ISB is a common technique for postoperative analgesia in patients undergoing shoulder surgery despite it being associated with diaphragmatic paresis from phrenic nerve block. One method of avoiding diaphragm paresis is performing blocks more distally along the brachial plexus (e.g. ASSB), thereby increasing the distance between block location and the phrenic nerve. This study compared two commonly used brachial plexus blocks (ISB and SCB) with a more distal block (ASSB), the aim being to prove its utility in providing non-inferior analgesia but a more favourable respiratory side effect profile. Several secondary outcomes evaluating pulmonary function (vital capacity, diaphragm excursion, SpO2 on room air) showed superiority in the ASSB group compared to the ISB group. The authors concluded that, in regard to the SCB, the data did not demonstrate statistical non-inferiority of SCB compared to ISB in terms of analgesia, however, the SCB group was associated with improved respiratory outcomes, including a higher preservation of vital capacity and FEV1. Furthermore, the ASSB, without a concomitant axillary nerve block, results in non-inferior lung-sparing analgesia when compared to ISB. Of note, patients with pre-existing lung dysfunction were excluded from the study and therefore the results cannot be extrapolated to this patient group. This paper emphasises that careful selection of an appropriate brachial plexus block is important in minimising respiratory side effects and supports the use of an ASSB in achieving adequate analgesia with minimal respiratory complications as compared to ISB and SCB.

Reference: Anesthesiology 2018;129(1):47-57

Abstract

The effect of adding subarachnoid epinephrine to hyperbaric bupivacaine and morphine for repeat cesarean delivery: A double-blind prospective randomized control trial

Authors: Katz D et al.

Summary: This North American, single centre, prospective, double-blinded, randomised controlled trial examined whether the addition of adrenaline (epinephrine) to hyperbaric bupivacaine prolonged the duration of sensory block for repeat caesarean delivery. Over a 1-year period, 68 patients were given a combined spinal epidural for repeat caesarean section and randomised to one of three groups (high dose, low dose or no adrenaline). The volume of intrathecal anaesthetic was standardised with normal saline (1.5 mL heavy bupivacaine, 0.5 mL preservative-free morphine to each group, with either 0.2 mL preservative-free normal saline, 100 μg adrenaline in 0.1 mL, or 200 μg adrenaline in 0.2 mL to top up to 2.2 mL total). The primary outcome was time to T-10 regression or intraoperative activation of the epidural. Secondary outcomes were time to knee extension (Modified Bromage 3 score). The mean difference in time to postoperative regression of sensory blockade to T-10 dermatome level as measured by pinprick sensation (primary outcome) was greatest in the high-dose group compared with the no adrenaline group (median difference 40 min; 95% CI 15-60, p = 0.007), followed by the high-dose group compared with the low-dose group (median difference 30 min; 95% CI 15-45, p = 0.007). Comparisons between the low-dose and no adrenaline groups were not significant.

Comment: (Harry Burnett) The addition of adrenaline to intrathecal anaesthetic has become standard practice in many obstetric anaesthetic units. The authors of this study elegantly assessed adrenaline as an adjuvant to bupivacaine-based spinal anaesthesia, which has previously shown inconsistent results compared to lignocaine or tetracaine studies. Sensory level was assessed with an 18 gauge needle in the midclavicular line in caudad to cephalad direction until thoracic T4 level was “exactly the same” as pinprick on the shoulder. Verbal pain scores of 0-10 were used. All patients sat for the combined spinal epidural, which would have contributed to longer sitting time and change in distribution of the block when compared with other studies, which only used intrathecal techniques. Confounders were generally well controlled, however, the presence of the epidural may have impacted the effect of neuraxial block (inserted with loss of resistance to air technique with no test dose), “Time to epidural activation” may have been triggered by a change in quality of the spinal block rather than its regression. The epidural was, however, considered to be ethically necessary in case patients in the adrenaline cohort required rescue analgesia. The main area of weakness in this study was that the authors did not vary the intrathecal dose or volume based on patient height, which is common practice. Mean heights and weights, with standard deviations, were reported in patient demographics, which were close but not the same. Finally, comparisons of difference between the low-dose and no adrenaline group were not significant, suggesting if you’re going to use adrenaline you should give a high dose and make it count.


Abstract
A randomized trial of continuous noninvasive blood pressure monitoring during noncardiac surgery

Authors: Maheshwari K et al.

Summary: This RCT tested whether continuous non-invasive BP monitoring could reduce intraoperative hypotension in 316 patients with ASA III or IV scores undergoing moderate-to-high-risk non-cardiac surgery under general anaesthesia. Time-weighted average mean arterial pressure (MAP) <55 mmHg was reduced by 0.05 mmHg (95% CI 0.00-0.22) with continuous BP monitoring versus 0.11 mmHg (95% CI 0.00-0.54; p = 0.039) with intermittent BP monitoring.

Comment: (Sachin Hansra) Intraoperative hypotension is strongly associated with postoperative mortality, acute kidney injury and myocardial ischaemia. With this fact in mind, anaesthetists from the Anaesthesiology Institute of the University Hospital Zurich, Switzerland, hypothesised that; early detection of hypotension via the use of non-invasive continuous monitoring will prompt more timely management and thereby reduce periods of hypotension. Interestingly, continuous non-invasive monitoring is not commonly utilised and was conducted via the use of a ClearSight™ non-invasive finger cuff. Shown to be non-inferior to oscillometric methods and comparable to that of arterial lines, the cuff allows for real-time haemodynamic measurements. Looking at 320 patients split into two groups, patients were chosen from ASA III-IV, going for non-cardiac surgery deemed to be moderate-to-high risk. All patients were monitored with both continuous non-invasive and intermittent oscillometric cuffs. Anaesthetists were not aware of continuous non-invasive readings in the “blind” group, but able to use both intermittent and continuous readings in the “unblind” group. Hypotension in the trial was measured in a clever way using Time-Weighted-Average MAPs (TWA MAP). This meant that rather than each MAP reading contributing equally to a final average, some MAP measurements contributed more than others as TWA MAP takes into account duration and severity. During the intraoperative period, the anaesthetists were given the directive to avoid hypotension (defined as a MAP >65) and rather unsurprisingly, there was a two-fold decrease in TWA MAP <65 mmHg for the continuous non-invasive monitored group (0.05 mmHg) versus the intermittent monitored groups (0.11 mmHg). What this equates to is for a 4-hour surgery, the continuously monitored group would spend TWA of 12 mmHg·minutes below the MAP aim of 65 mmHg vs 26 mmHg·minutes in the intermittent monitored group. However, the utility in this information is the question gone unanswered, as it was not designed to assess the clinical significance of post-operative outcomes. So whilst the study suggests that we should be utilising non-invasive continuous blood pressure monitoring in moderate-risk surgeries, as it reduces intraoperative hypotension, it still remains unclear whether or not simply treating the numbers or successfully reducing the number of adverse post-operative events.


Propofol compared with sevoflurane general anaesthesia is associated with decreased delayed neurocognitive recovery in older adults

Authors: Zhang Y et al.

Summary: This Chinese single centre, double-blind study compared the incidence of delayed neurocognitive recovery between propofol- and sevoflurane-based general anaesthesia in older adults (aged ≥65 and <90 years) after major cancer surgery. A total of 392 patients were enrolled and randomised. The incidence at one week of postoperative cognitive dysfunction (POCD) was significantly lower in the propofol group (14.6%) than in the sevoflurane group (23.2%; OR 0.577; 95% CI 0.342-0.975; p = 0.039). Secondary end points including postoperative complication rates and length of hospital admission were not significantly different between the groups.

Comment: (Ben Cahill) Anaesthetic agents such as propofol and sevoflurane have been implicated in the aetiology of POCD, but previous in vitro studies and clinical trials have yielded conflicting results of differences between each agent. This trial had several advantages over previous publications. A large sample size of older Chinese adults (age >65 and <90 years) was assessed preoperatively and at one week postoperatively using a comprehensive neuropsychological test battery to diagnose POCD against internationally accepted criteria. An appropriately matched non-surgery control group was included in the study design to control for learning of the test battery. Subjects in both test groups were appropriately matched for age, gender, education level (including baseline MMSE), comorbidities and functional capacity (assessed by ASA physical status, NYHA classification and Charlson comorbidity index). Maintenance anaesthetic agents were randomly assigned to patients (either propofol or sevoflurane) but doses of induction agents and postoperative opioid were not strictly protocolled. Despite this, there were no differences in the doses of possible confounders such as midazolam between the treatment groups. The primary endpoint of this study suggests that propofol maintenance anaesthesia may offer some neuroprotection when compared to volatile agents during cancer surgery in older adults. There was no difference found between the treatment groups at one month with a follow-up telephone-based assessment of cognition and all other clinical outcomes were similar. Several factors limit the generalisability of these findings: propofol was used as the induction agent for the sevoflurane group; many different intra-abdominal and intra-thoracic surgical groups were included (although were matched between treatment groups); and the non-surgery control group was found to have a 6.8% incidence of cognitive dysfunction at one week, which suggests a significant false positive rate of POCD diagnosis may exist.


Femoral nerve catheter vs local infiltration for analgesia in fast track total knee arthroplasty: short-term and long-term outcomes

Authors: Fenten MGE et al.

Summary: This prospective, blinded, Dutch single-centre RCT compared the effects of percutaneous local anaesthetic infiltration (LIA) versus LIA of the posterior knee capsule in combination with a femoral nerve block (FNB) catheter, on short- and long-term pain and functional outcomes in 80 patients (mean age 65 years, ASA II-III) undergoing fast-track total knee arthroplasty (TKA) under single-dose spinal anaesthesia. LIA recipients perierterial 0.2% ropivacaine for post-operative analgesia (administered by the surgeon), and patients in the FNB group received LIA (0.2% ropivacaine) of the posterior capsule and 6-hourly 20 mL 0.2% ropivacaine boluses via FNB catheter (placed preoperatively), up to 18-hours post surgery. There were no differences between groups in long-term functional capacity, patient satisfaction and hospital length of stay. In the first 2 days postoperatively, subjects in the FNB group had slightly lower pain scores and used less opioids, and subjects in the LIA group had a higher level of accelerometer activity (though no difference in ability to mobilise). Three (p = 0.047) and 12 months (p = 0.021) after surgery, subjects in the FNB group had lower maximum pain scores and were six-fold less likely to use any pain medication 12 months after surgery (OR 5.9; 95% CI 1.1-31.7; p = 0.037).

Comment: (Stefan Saric) TKA improves knee joint function in patients with osteoarthritis, but severe postoperative pain may hinder rehabilitation and predispose patients to persistent pain. Fenten et al., examined the short- and long-term effects on pain and functional outcomes of two different postoperative pain protocols in patients undergoing TKA. Eligible patients had non-inflammatory knee osteoarthritis, were scheduled for primary, unilateral TKA, and were concordantly randomised to either receiving perierterial LIA only, or LIA to the posterior capsule and 6-hourly FNB catheter boluses. Notably, patients in the LIA only group received a “sham femoral catheter” taped to their skin, and treating surgeons and anaesthetists weren’t blinded – though research assistants and physical therapists collecting the pain and functional data were. The primary outcome measure was functional capacity at 12 months after surgery, and no difference was found using the Timed Up and Go Test (TUG), Stair Climbing Test (SCT) and the Six Minute Walking Test (6MWT). Secondary measures of patient satisfaction, hospital length of stay, and post-operative mobility were also equivalent. FNB patients had lower maximum pain scores 12 months post surgery, but the authors acknowledge the possibility of recall bias, and note that average pain scores at 12 months were low and equivocal. FNB patients were also significantly less likely to use any analgesia daily for their knee pain 12 months post surgery, but the clinical significance or causality is unclear. Given that Fenten et al., present good evidence for equivalent functional outcomes between these TKA pain protocols, future studies should focus on analgesia requirement and pain scores (using pain diaries) as the primary longitudinal outcome measure.